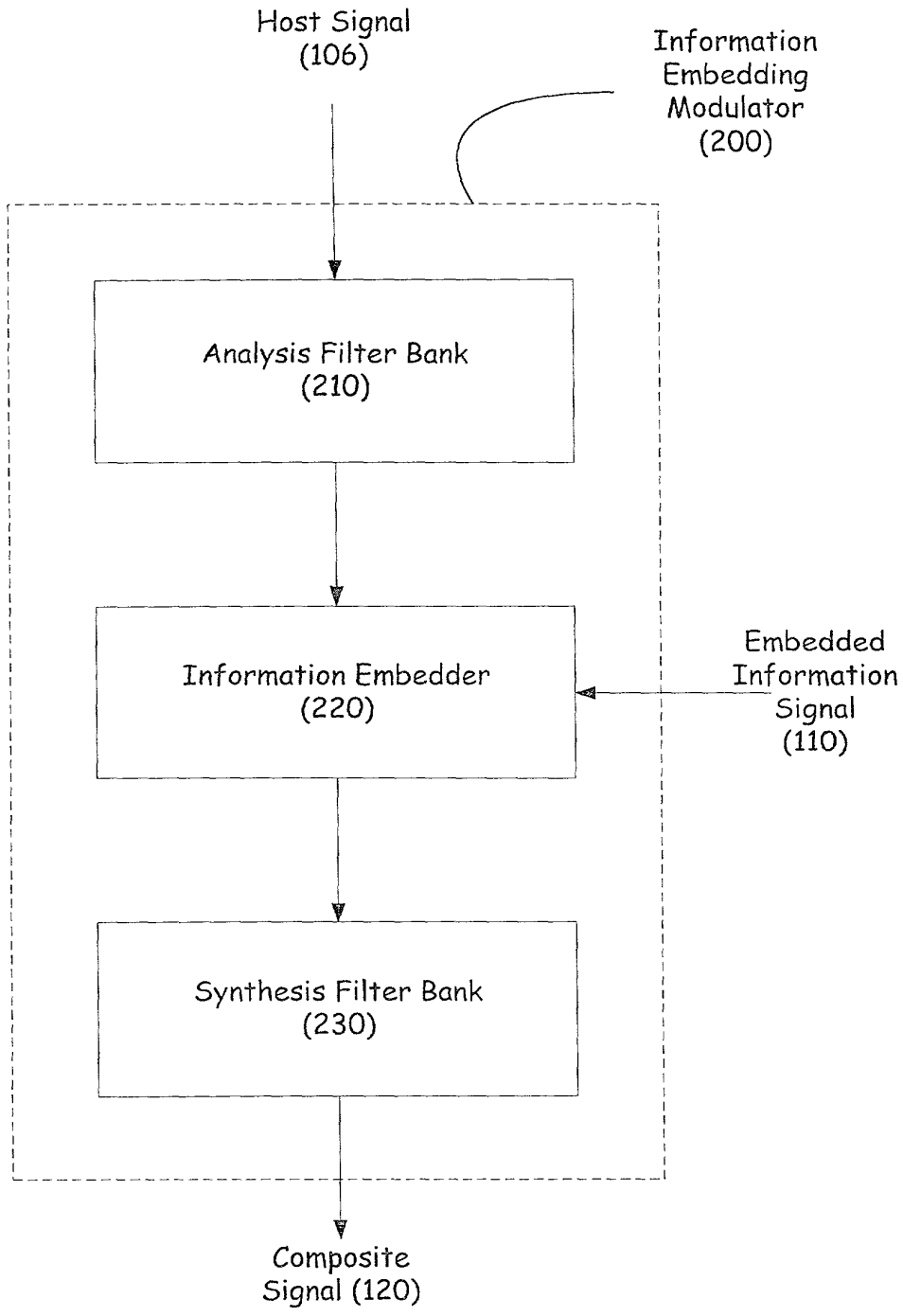
Host Signal
(106)
Information
Embedding
Modulator
(200)
Analysis Filter Bank
(210)
Information Embedder
(220)
Embedded
Information
Signal
(110)
Synthesis Filter Bank
(230)
Composite
Signal (120)

Fig. 1

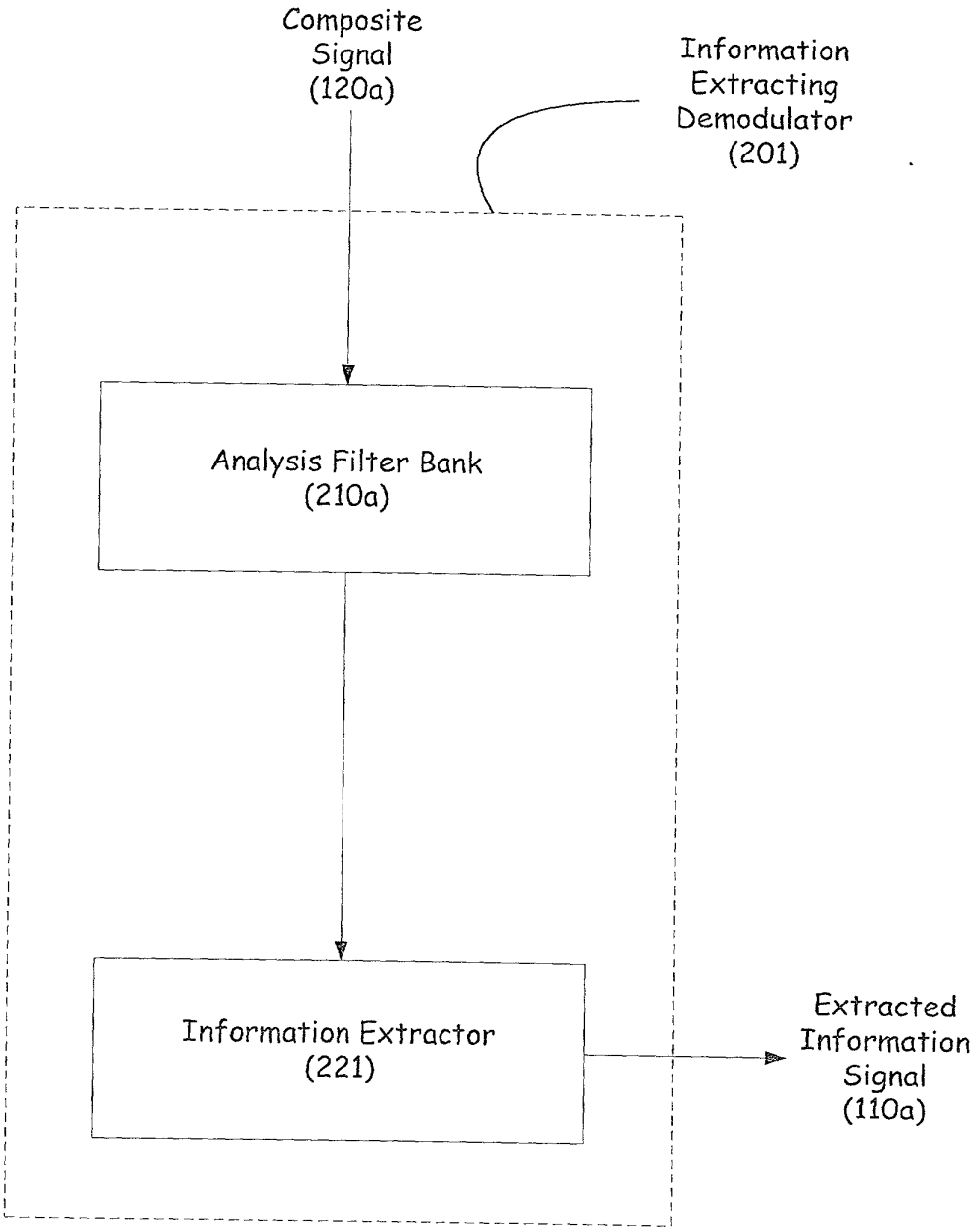
Composite
Signal
(120a)
Information
Extracting
Demodulator
(201)
Analysis Filter Bank
(210a)
Information Extractor
(221)
Extracted
Information
Signal
(110a)

Fig. 2

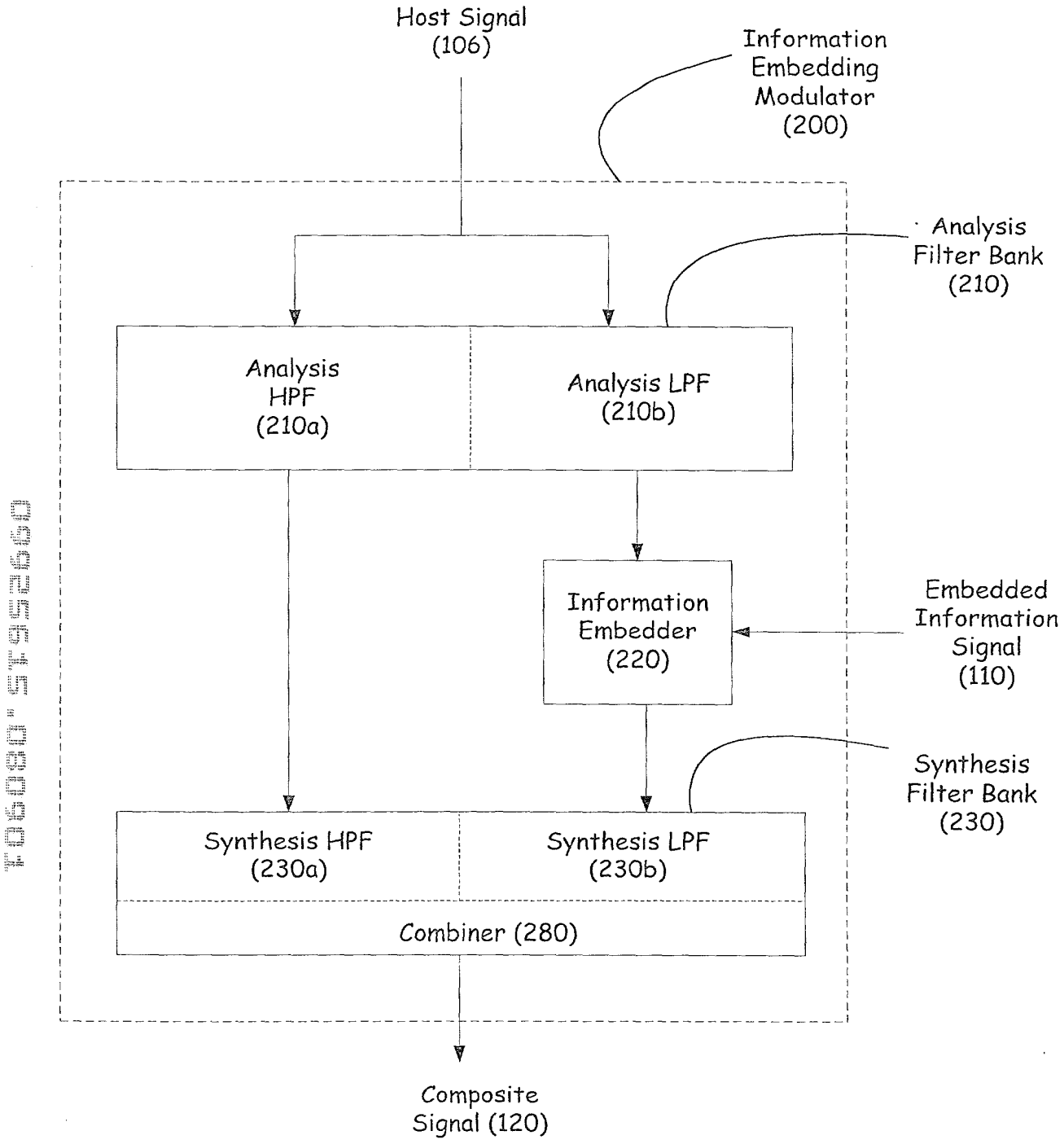
Host Signal
(106)
Information
Embedding
Modulator
(200)
Analysis
Filter Bank
(210)
Analysis
HPF
(210a)
Analysis LPF
(210b)
Information
Embedder
(220)
Embedded
Information
Signal
(110)
Synthesis
Filter Bank
(230)
Synthesis HPF
(230a)
Synthesis LPF
(230b)
Combiner (280)
Composite
Signal (120)

Fig. 3

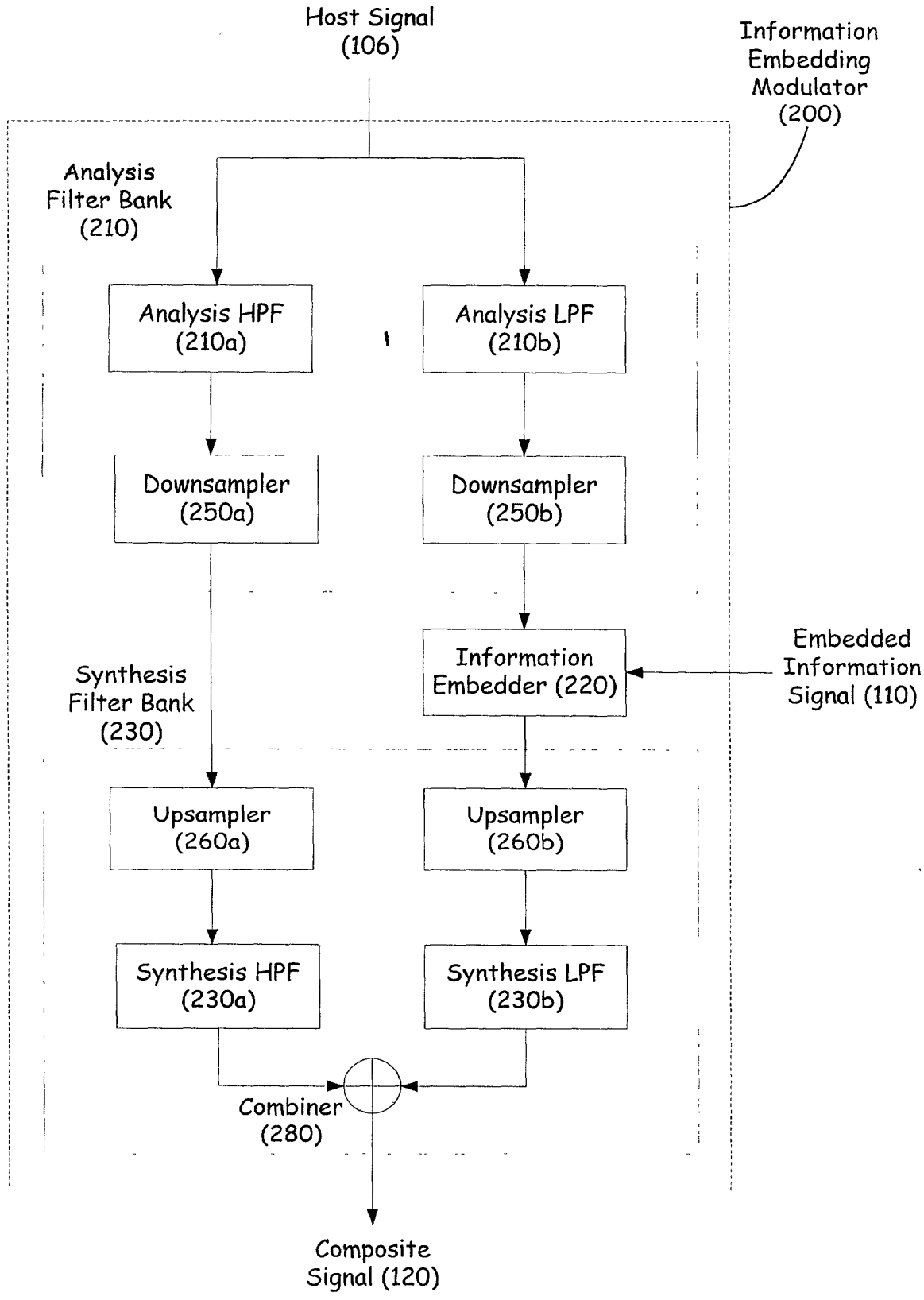
Host Signal
(106)
Information
Embedding
Modulator
(200)
Analysis
Filter Bank
(210)
Analysis HPF
(210a)
Analysis LPF
(210b)
Downsampler
(250a)
Downsampler
(250b)
Information
Embedder (220)
Embedded
Information
Signal (110)
Synthesis
Filter Bank
(230)
Upsampler
(260a)
Upsampler
(260b)
Synthesis HPF
(230a)
Synthesis LPF
(230b)
Combiner
(280)
Composite
Signal (120)

Fig. 4

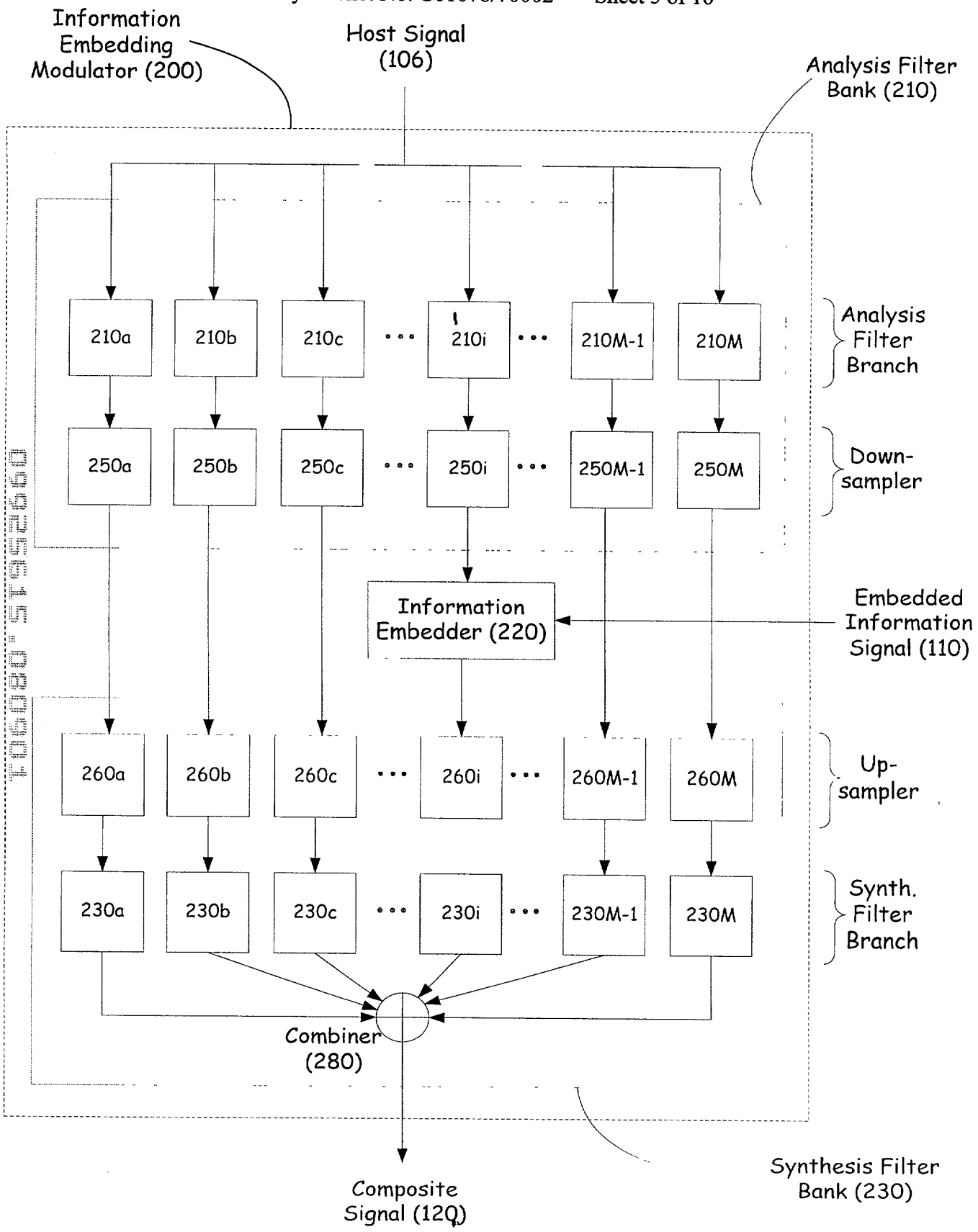
Information Embedding Modulator (200)
Host Signal (106)
Analysis Filter Bank (210)
210a
210b
210c
210i
210M-1
210M
Analysis Filter Branch
250a
250b
250c
250i
250M-1
250M
Down-sampler
Information Embedder (220)
Embedded Information Signal (110)
260a
260b
260c
260i
260M-1
260M
Up-sampler
230a
230b
230c
230i
230M-1
230M
Synth. Filter Branch
Combiner (280)
Composite Signal (120)
Synthesis Filter Bank (230)

Fig. 5

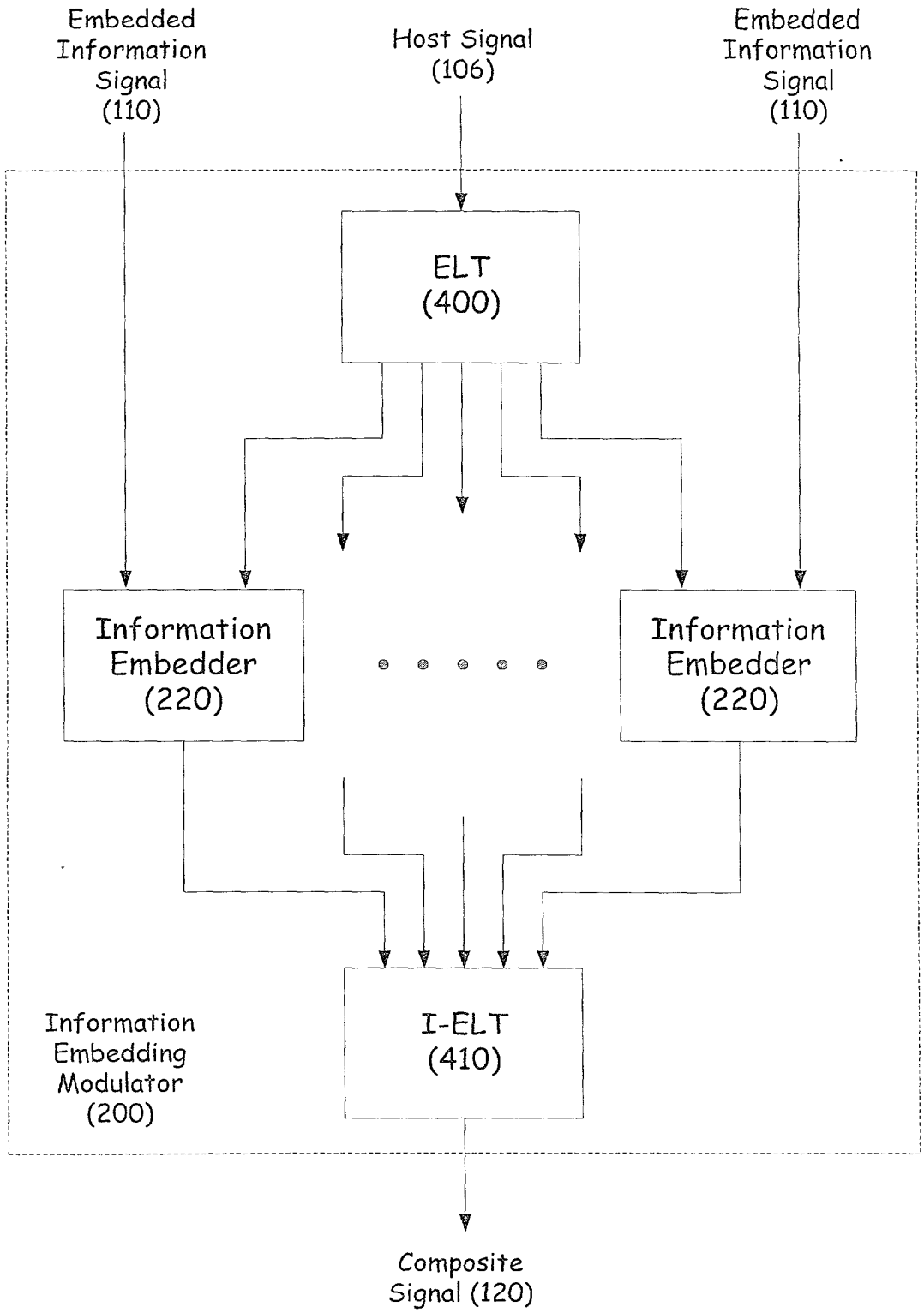
Embedded Information Signal (110)
Host Signal (106)
Embedded Information Signal (110)
ELT (400)
Information Embedder (220)
Information Embedder (220)
Information Embedding Modulator (200)
I-ELT (410)
Composite Signal (120)

Fig. 6

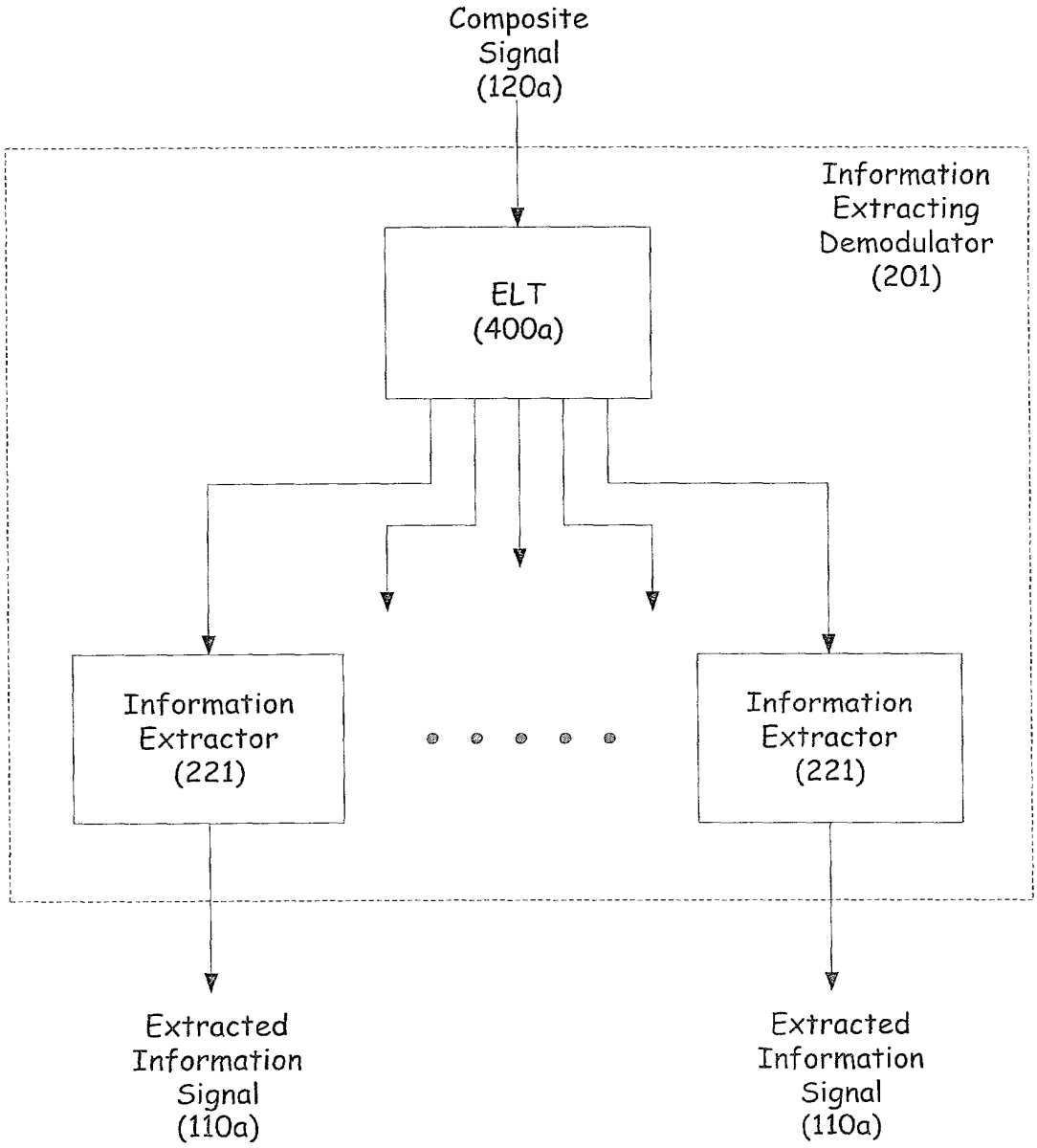
Composite
Signal
(120a)
Information
Extracting
Demodulator
(201)
ELT
(400a)
Information
Extractor
(221)
Information
Extractor
(221)
Extracted
Information
Signal
(110a)
Extracted
Information
Signal
(110a)

Fig. 7

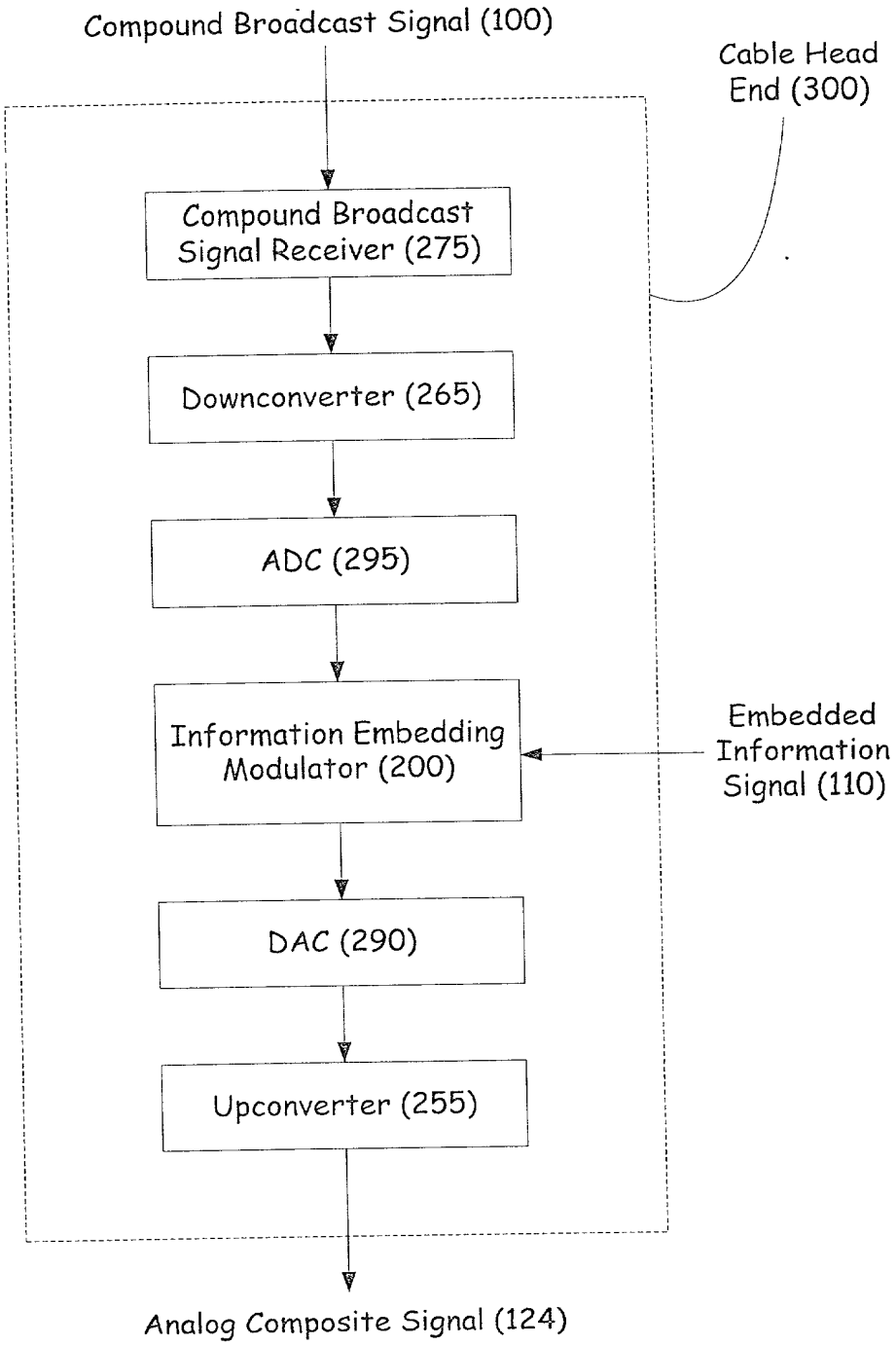
Compound Broadcast Signal (100)
Cable Head End (300)
Compound Broadcast Signal Receiver (275)
Downconverter (265)
ADC (295)
Information Embedding Modulator (200)
Embedded Information Signal (110)
DAC (290)
Upconverter (255)
Analog Composite Signal (124)

Fig. 8

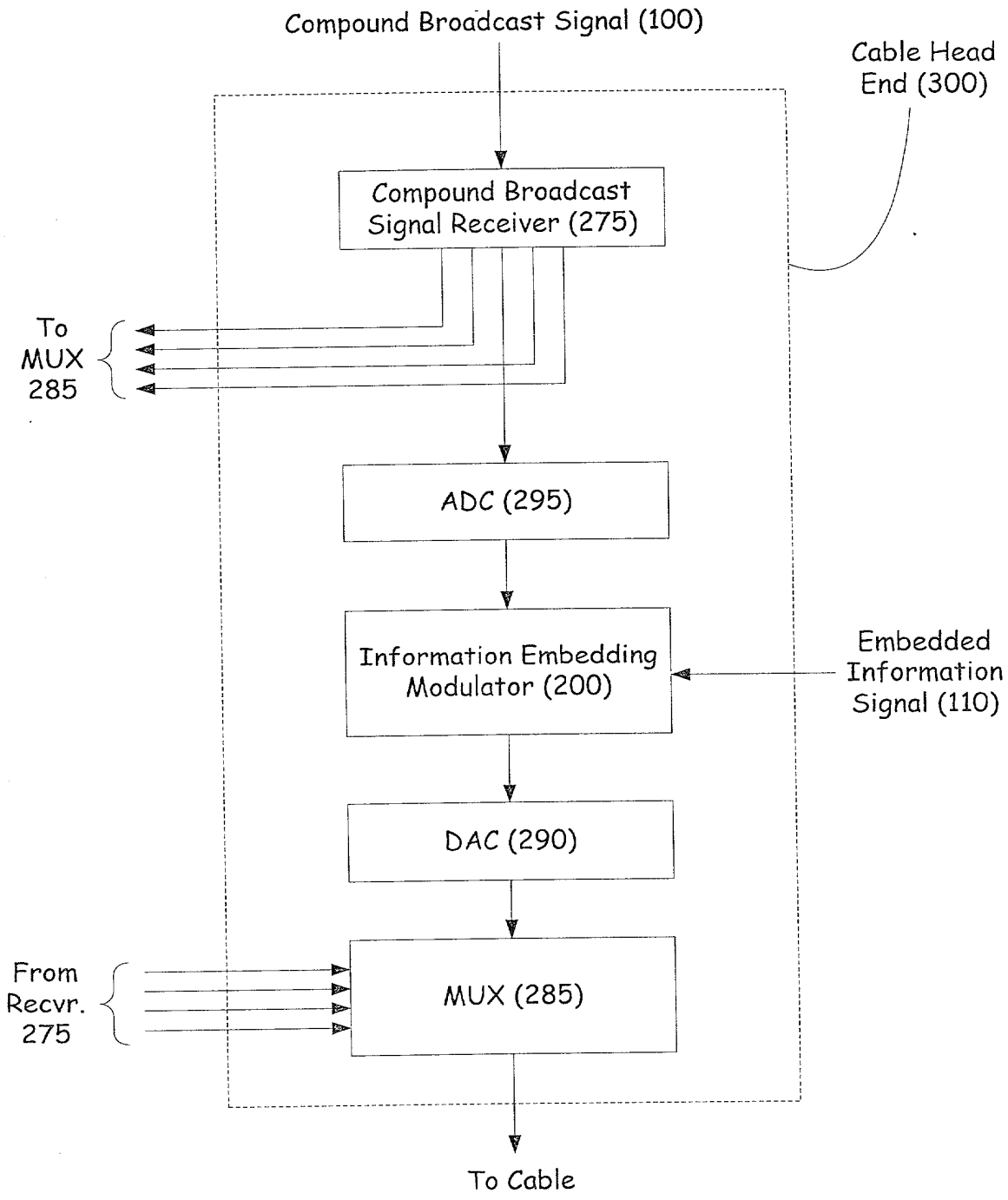
Compound Broadcast Signal (100)
Cable Head End (300)
Compound Broadcast Signal Receiver (275)
To MUX 285
ADC (295)
Information Embedding Modulator (200)
Embedded Information Signal (110)
DAC (290)
From Recvr. 275
MUX (285)
To Cable

Fig. 9

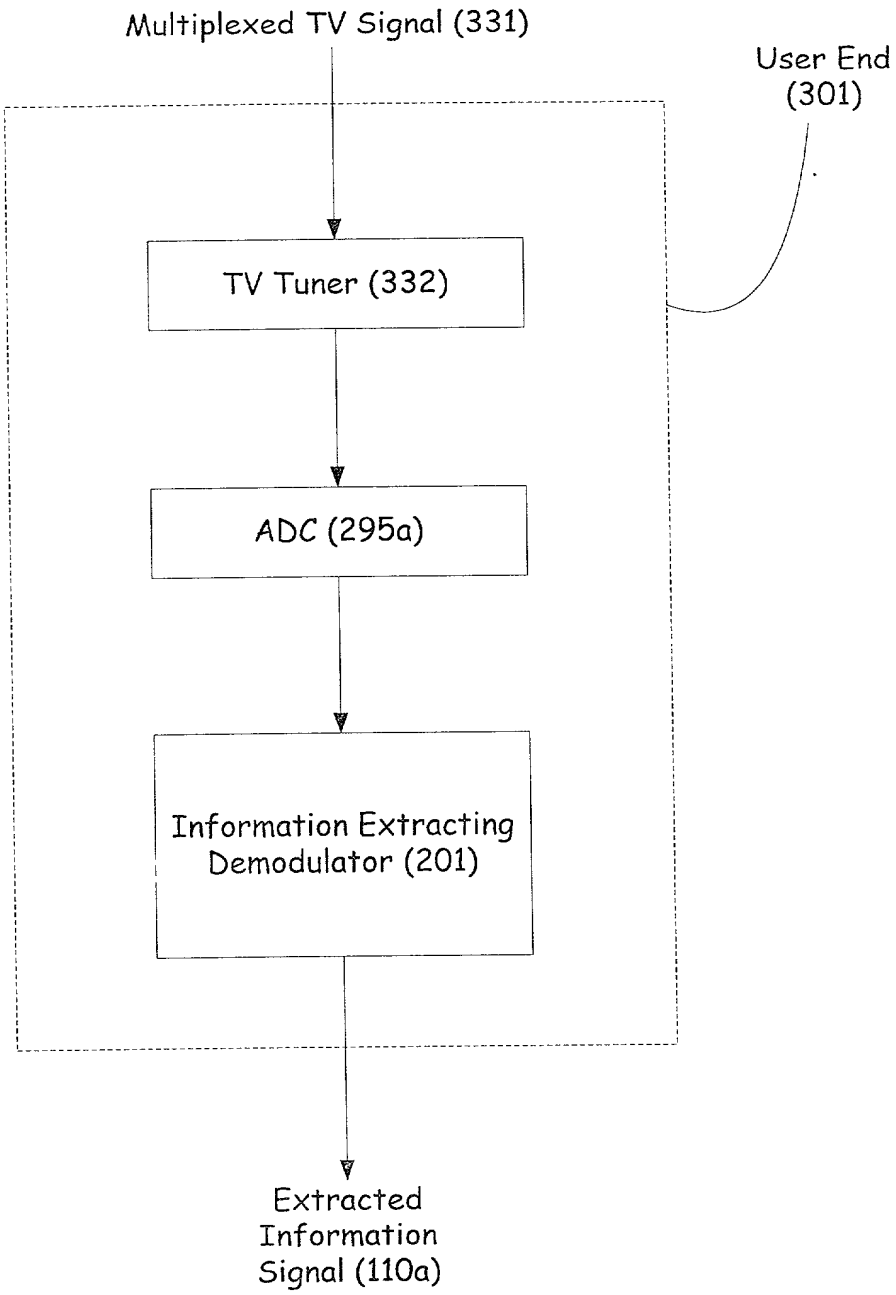
Multiplexed TV Signal (331)
User End
(301)
TV Tuner (332)
ADC (295a)
Information Extracting
Demodulator (201)
Extracted
Information
Signal (110a)

Fig. 10

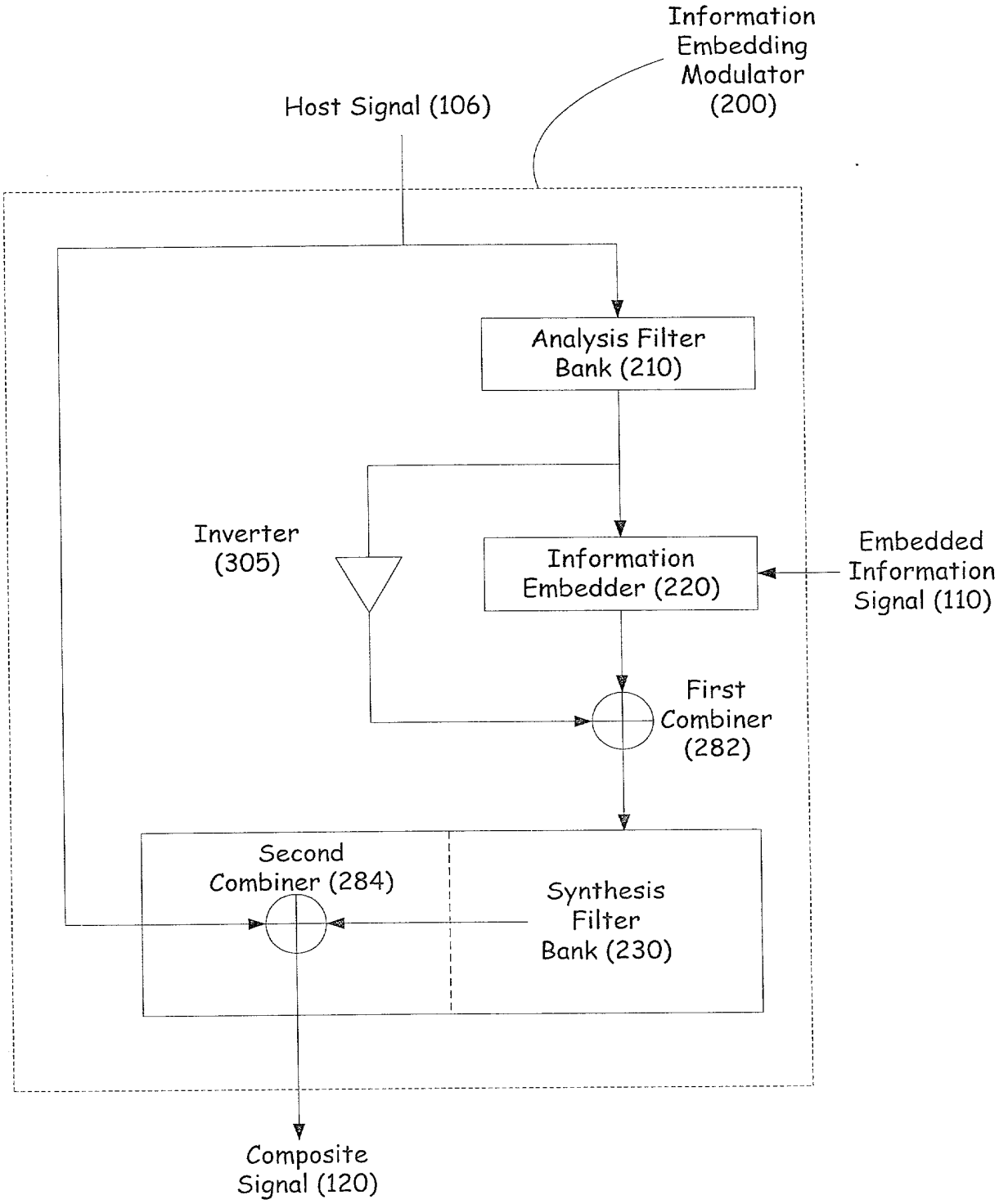
Information
Embedding
Modulator
(200)
Host Signal (106)
Analysis Filter
Bank (210)
Inverter
(305)
Information
Embedder (220)
Embedded
Information
Signal (110)
First
Combiner
(282)
Second
Combiner (284)
Synthesis
Filter
Bank (230)
Composite
Signal (120)

Fig. 11

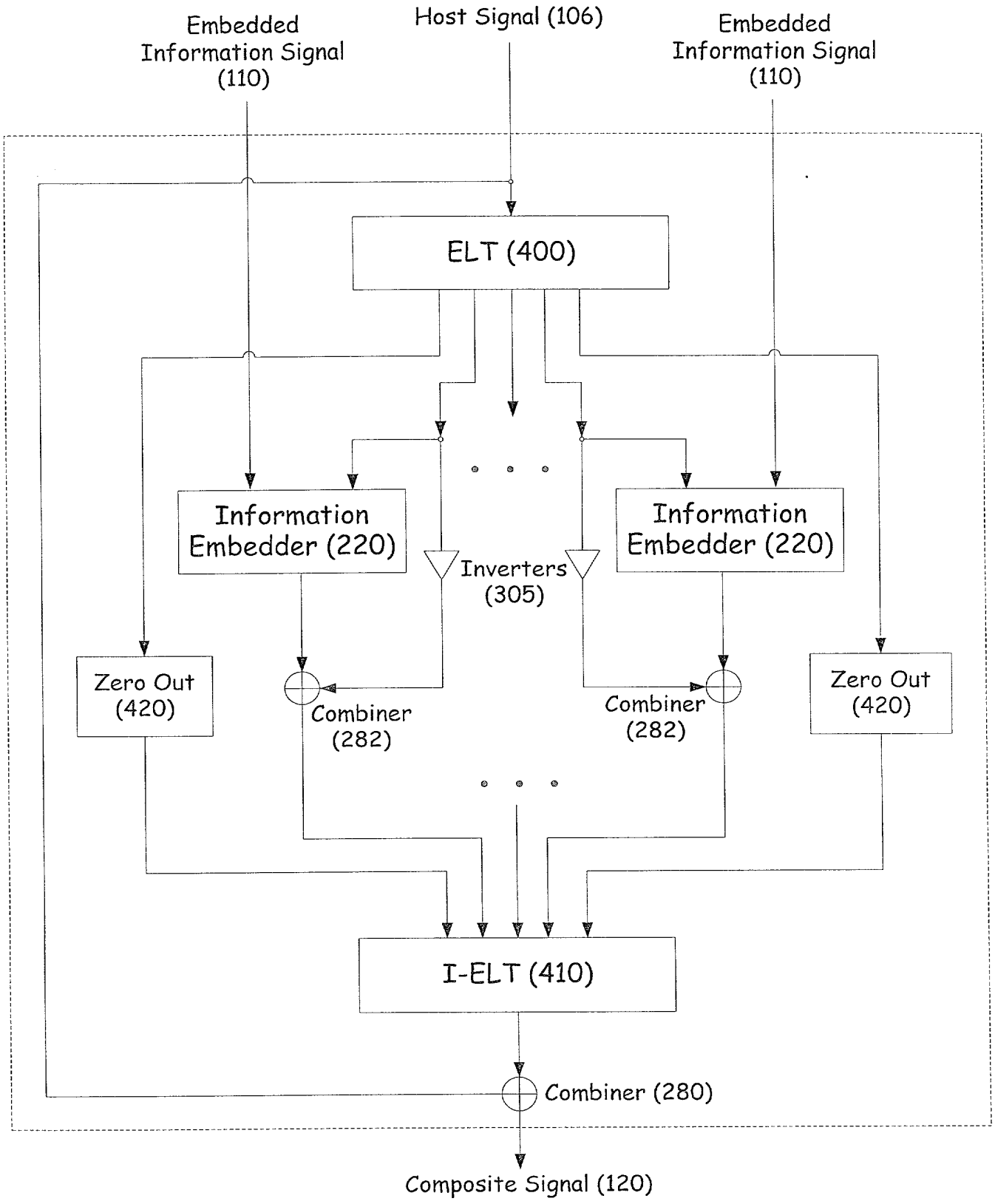
Embedded Information Signal (110)
Host Signal (106)
Embedded Information Signal (110)
ELT (400)
Information Embedder (220)
Information Embedder (220)
Inverters (305)
Zero Out (420)
Combiner (282)
Combiner (282)
Zero Out (420)
I-ELT (410)
Combiner (280)
Composite Signal (120)

Fig. 12

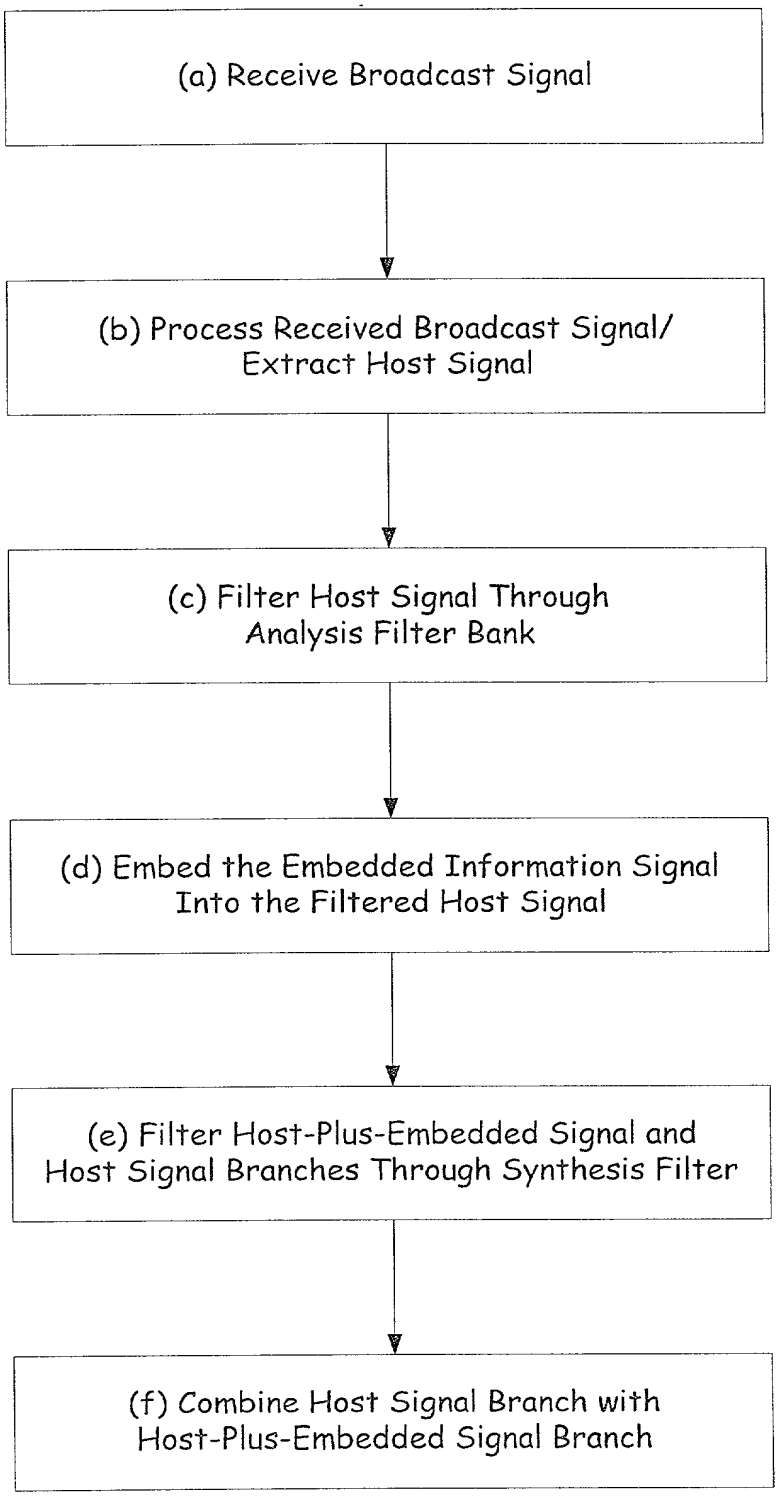
(a) Receive Broadcast Signal
(b) Process Received Broadcast Signal/ Extract Host Signal
(c) Filter Host Signal Through Analysis Filter Bank
(d) Embed the Embedded Information Signal Into the Filtered Host Signal
(e) Filter Host-Plus-Embedded Signal and Host Signal Branches Through Synthesis Filter
(f) Combine Host Signal Branch with Host-Plus-Embedded Signal Branch

Fig. 13

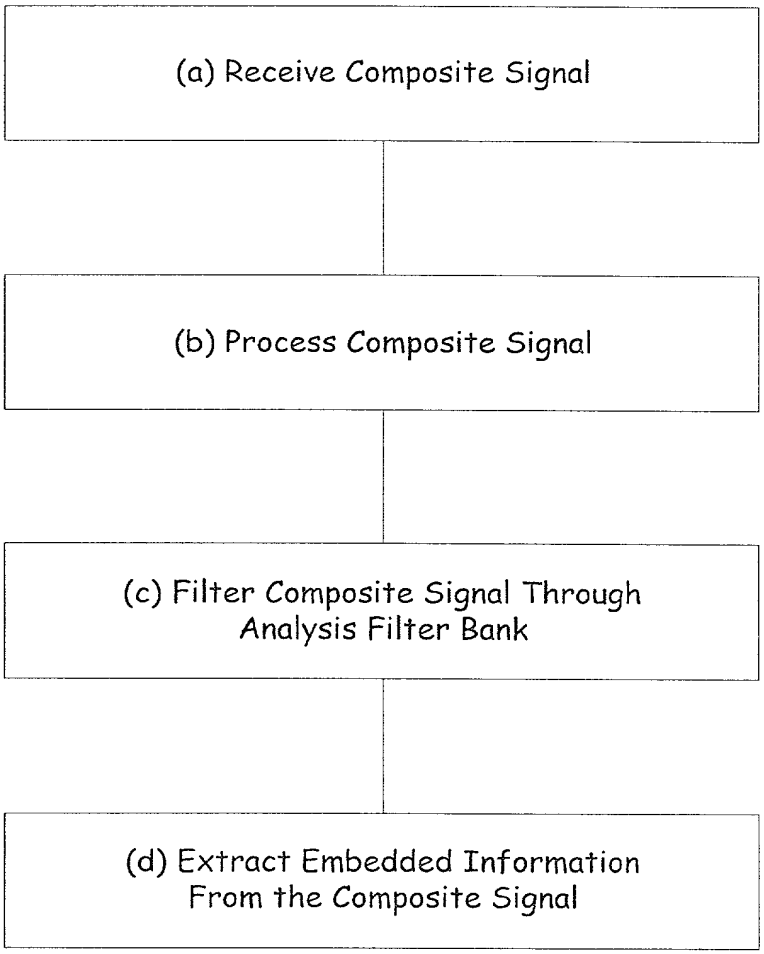
(a) Receive Composite Signal
(b) Process Composite Signal
(c) Filter Composite Signal Through Analysis Filter Bank
(d) Extract Embedded Information From the Composite Signal

Fig. 14

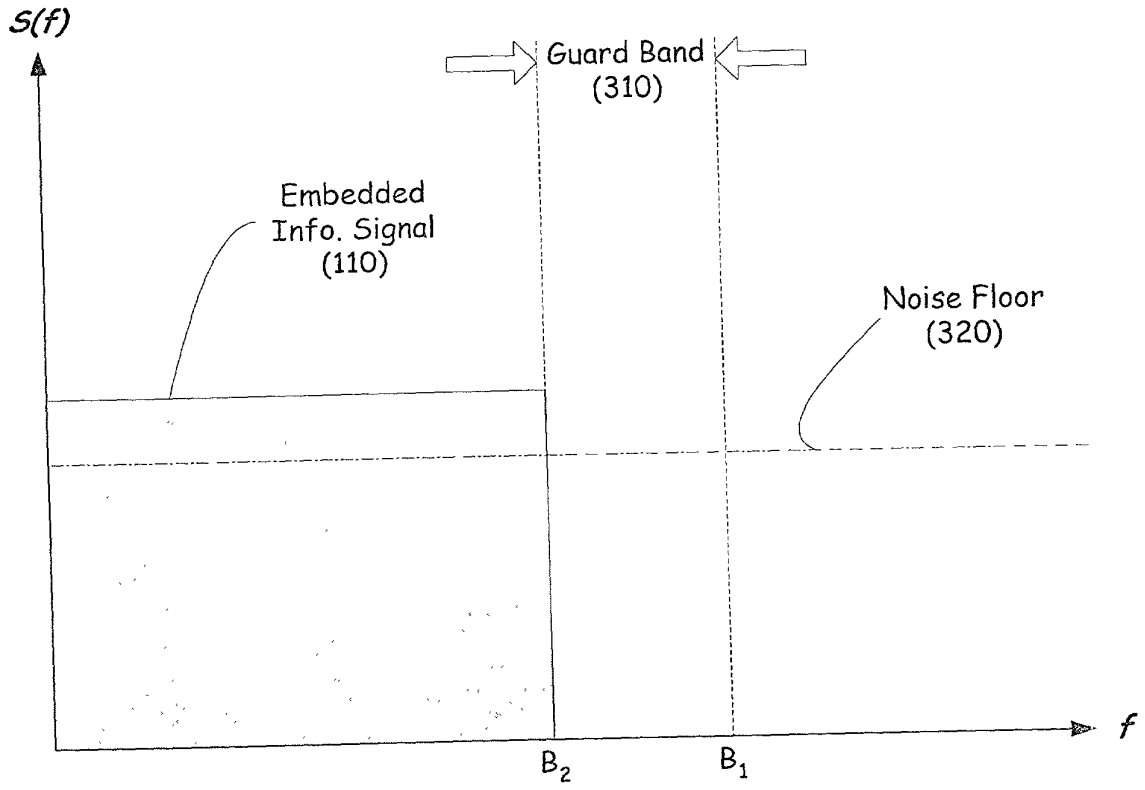
S(f)
Guard Band
(310)
Embedded
Info. Signal
(110)
Noise Floor
(320)
f
B_2
B_1

Fig. 15

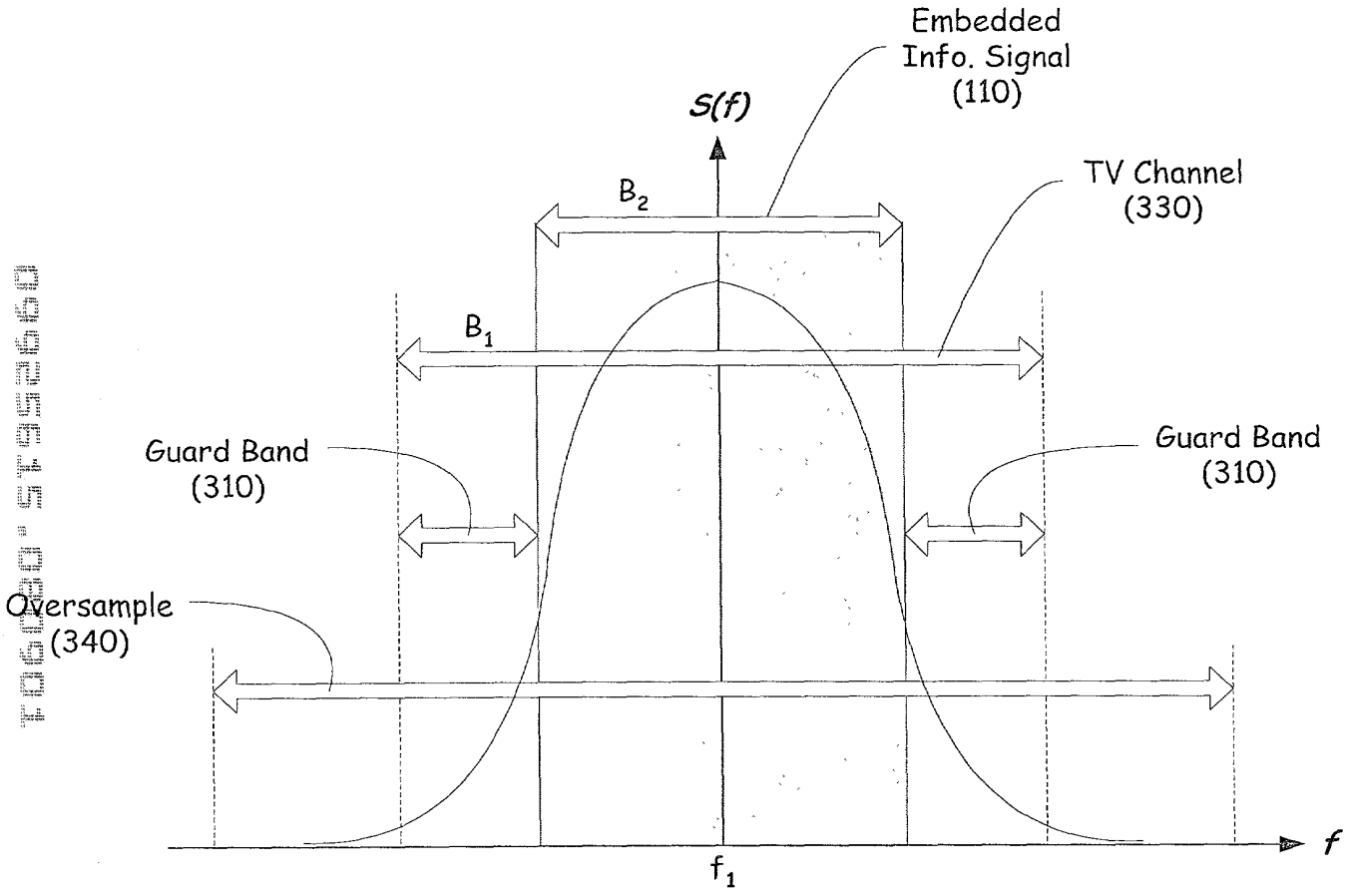
Embedded
Info. Signal
(110)
S(f)
TV Channel
(330)
B2
B1
Guard Band
(310)
Guard Band
(310)
Oversample
(340)
f
f1

Fig. 16